

IMPACT

Ideas.  
Insights.  
Impact.

ACTION

LAB



ALBERTA INNOVATES

# IMPLEMENTING FOR IMPACT PART A: INCORPORATING MONITORING SYSTEMS TO TRACK SOCIETAL IMPACT

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*AESIS Course: Institutional Structures for Societal Impact of Science*

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# LEARNING OBJECTIVES

## Implementing for Impact Part A: Incorporating Monitoring Systems to Track Societal Impact

1. Selecting **metrics that matter** – understanding the ‘What’, ‘Why’ and ‘Who’ of impact
2. Identifying **monitoring tools** for measuring institutional and societal impact
3. Reviewing considerations for **‘fit for purpose’ measurement approaches**

Acknowledgement: Some of the material based on ISRIA syllabus <http://www.theinternationalschoolonria.com>

# WHO WE ARE: THE PURPOSE OF THE IMPACT ACTION LAB



- The IAL partners with ecosystem players to amplify and activate the economic and societal impact of their Research and Innovation investments
- We are a network of global and local impact experts
- We work with institutions to enhance their capacity by incorporating performance and impact management systems that generate value and provide benefits to their community

# HOW DO WE DO THAT?

## By incorporating Performance and Impact Management Systems (PIMS)



THE HOUSE THAT IMPACT BUILT

*PIMS helps align organizational purpose and processes to achieve targeted outcomes and impact*



Continuously **IMPROVE & ADAPT**

Source: Alberta Innovates PIMS 3.0 May 21, 2022



# 1. SELECTING METRICS THAT MATTER

- UNDERSTANDING CONTEXT OF WHAT, WHY AND WHO



**START WITH THE  
END IN MIND -  
INTENDED  
IMPACTS**





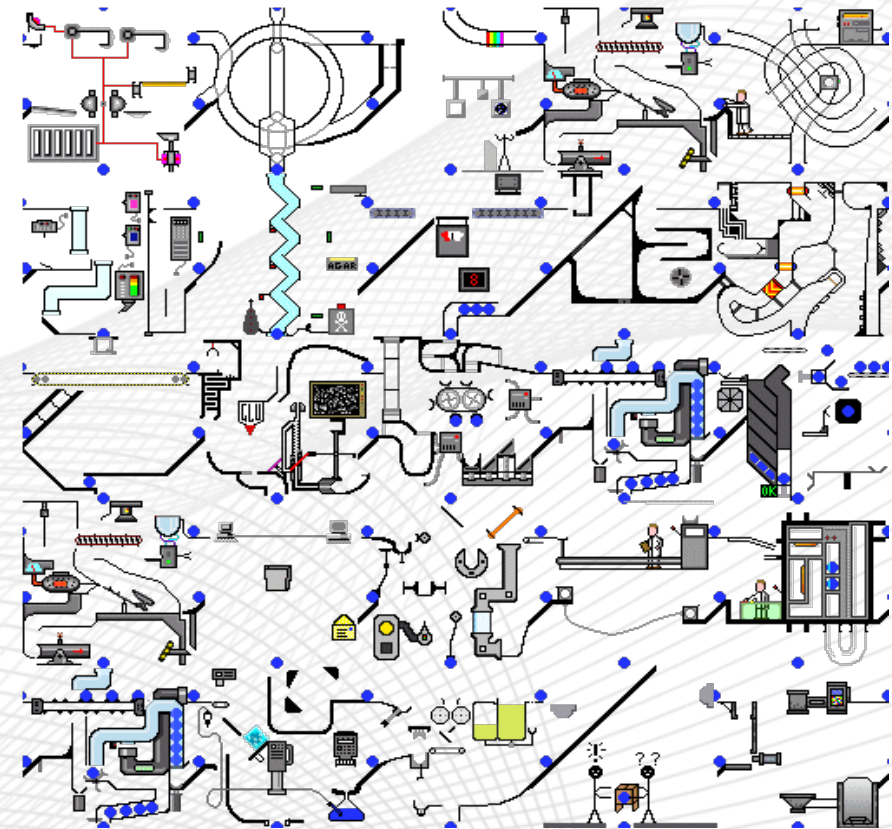
**“If you don't know where you are going,  
you'll end up someplace else.”**

**Yogi Berra**



The plain language question for measuring research impact **in any sector** is trying to answer:

*Has the research (science) made a difference?*



Simple question... but **answering it is anything but simple** in the multi-dimensional and complex 'real world' of research and impacts.



# UNDERSTANDING ‘WHAT’ IS IMPACT



MANY IMPACT DEFINITIONS.....

- ▶ “Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended” (OECD, 2002)
- ▶ “An **effect** on, **change** or **benefit** to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia” (REF, UK)

Understanding societal impact in the context of your jurisdictional ecosystem  
Understanding how societal Impact is defined at your Institution?

# UNDERSTANDING THE “WHY” OR INSTITUTIONAL MOTIVATIONS FOR IMPACT



## THE 4A'S



- ▶ **ACCOUNTABILITY**  
To promote responsible management of funds to taxpayers, donors, etc.
- ▶ **ADVOCACY**  
“Make the case” for research funding
- ▶ **ANALYSIS**  
What works in research funding?
- ▶ **ALLOCATION**  
What to fund (institution, field, people, etc.)

# UNDERSTANDING YOUR INSTITUTIONAL STRATEGY



## Institutional Strategic Alignment



- Vision & mission/purpose
- Values
- Goals & objectives
- Internal institutional impact reporting requirements
- External impact reporting requirements
- Internal/external ecosystem research excellence and impact assessment frameworks

Impact Mindset: thinking **Beyond** what an organization **Has, Does & Produces**  
To what **DIFFERENCE** it makes downstream to **beneficiaries** the '**So What**' to '**Now What**'

# UNDERSTANDING “WHO” YOUR INSTITUTION WANTS TO IMPACT



WHO ARE THE COMMUNITIES AND BENEFICIARIES OF YOUR RESEARCH THAT YOU WANT TO EFFECT?

WHO IS INTERESTED IN YOUR IMPACT AND WHAT QUESTIONS DO YOU NEED TO ANSWER?

Public, Policymakers, Patients, Community Groups.....





“Our purpose as a university is to contribute to the body of world knowledge while simultaneously engaging our students in learning guided by processes of discovery, creativity, and innovation. The knowledge that we create promotes cultural understanding and social justice, improves quality of life, and helps to secure a prosperous and sustainable future”

*Source: University of Calgary, Academic Plan 2018-23*



GROUP  
DISCUSSION

### Discussion questions:


1. *What are the societal impacts for this University?*
2. *What are your institution’s intended societal impacts?*



## **2. IDENTIFYING MONITORING TOOLS FOR MEASUREMENT**

- DEFINING INDICATORS OF SUCCESS**

# DEMONSTRATE IMPACT



**IMPACT**



HOW?

# PERENNIAL CHALLENGES IN MEASURING IMPACT



## Time Lags



## Transaction Costs



## Quality



## Attribution and Contribution

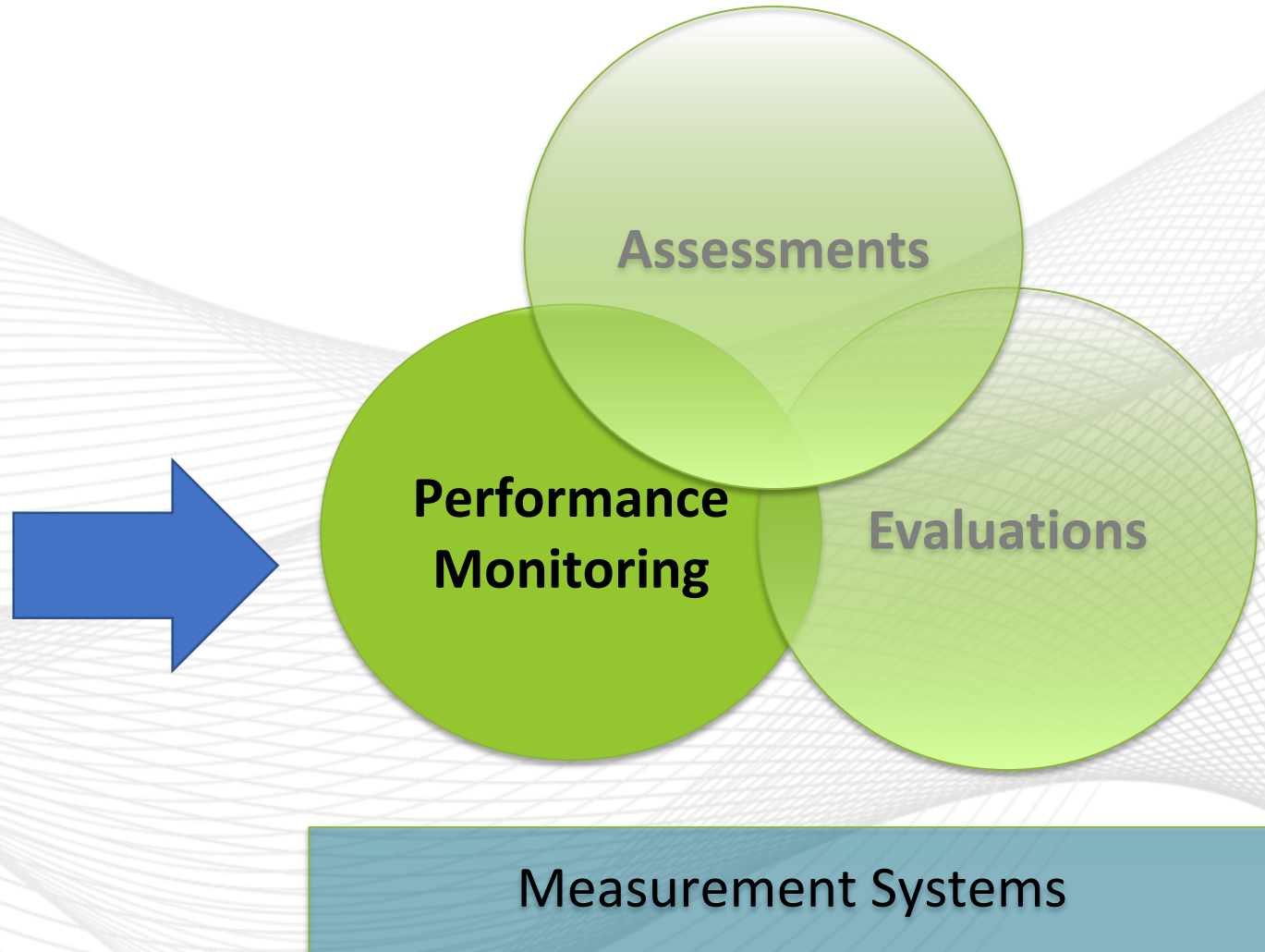


## Unit of Analysis

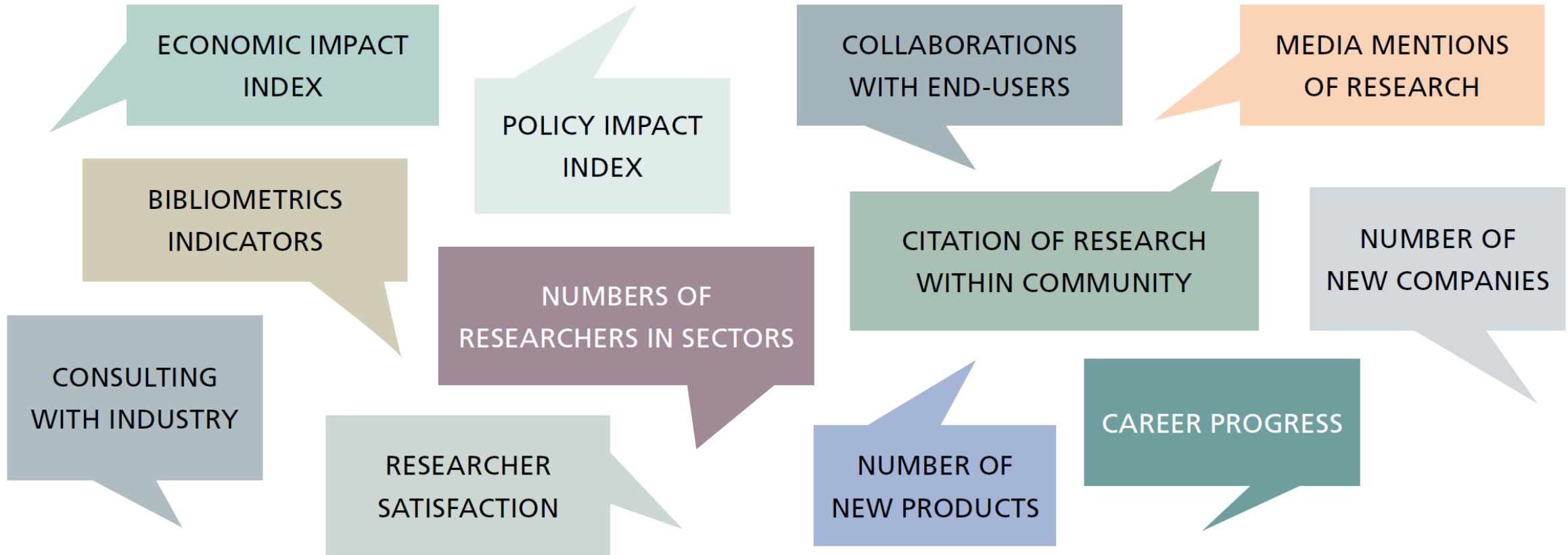




# LEVERAGING EXISTING SYSTEMS



# MEASUREMENT SYSTEMS - USING INDICATORS AND MEASURES TO TRACK PROGRESS TO IMPACT



# LEADING AND LAGGING INDICATORS



## Lag Measures

- Revenue Growth
- Revenue Mix

- Customer Satisfaction
- Customer Retention

- Share of Segment
- New Product Revenue
- Cross-Sell Ratio

- Employee Satisfaction
- Strategic Skills Coverage

## Lead Measures

- Number of accounts

- Time Spent with Customer

- Number of sales leads

- Number of résumés received
- Personal Goal Alignment

Source:egmgrp.com

Provides the evidence **AFTER** the impact has occurred

### CHARACTERISTICS:

- Output-oriented
- Easy to measure
- Hard to influence or improve

Gives an indication **BEFORE** the anticipated impact occurs

### CHARACTERISTICS:

- Input-oriented
- Hard to measure
- Easy to influence

# SOURCES FOR GENERATING IMPACT INDICATORS



## RESEARCH LITERATURE:

- Frameworks and indicators
- White papers, Guidelines and standards
- Systematic literature reviews



## MIXED DATA COLLECTION METHODS:

- Mix of qualitative and quantitative indicators
- Assessments/evaluations (Economic, Environmental, Health, Social etc.)
- Impact case studies and surveys

## INSTITUTIONAL DATA SOURCES:

- Monitoring and Reporting Tools
- Grant Management – applications and end or grant reports

# DOES YOUR JURISDICTION HAVE A RESEARCH IMPACT

## FRAMEWORK? THESE FRAMEWORKS OUTLINE IMPACT ASSESSMENT CRITERIA AND MEASURES



- ▶ **Research Excellence Framework (REF), UK** – assesses performance of UK universities to determine funding allocation



- ▶ **National Science Foundation, US** – assesses intellectual merit (advancing knowledge) as well as the broader impacts (societal benefits)



- ▶ **Excellence in Research for Australia (ERA), AU** – uses bibliometrics, and other quantitative indicators, to map R&D output



- ▶ **Canadian Academy of Health Science (CAHS), CA** – aims to provide consistency and comparability while retaining flexibility



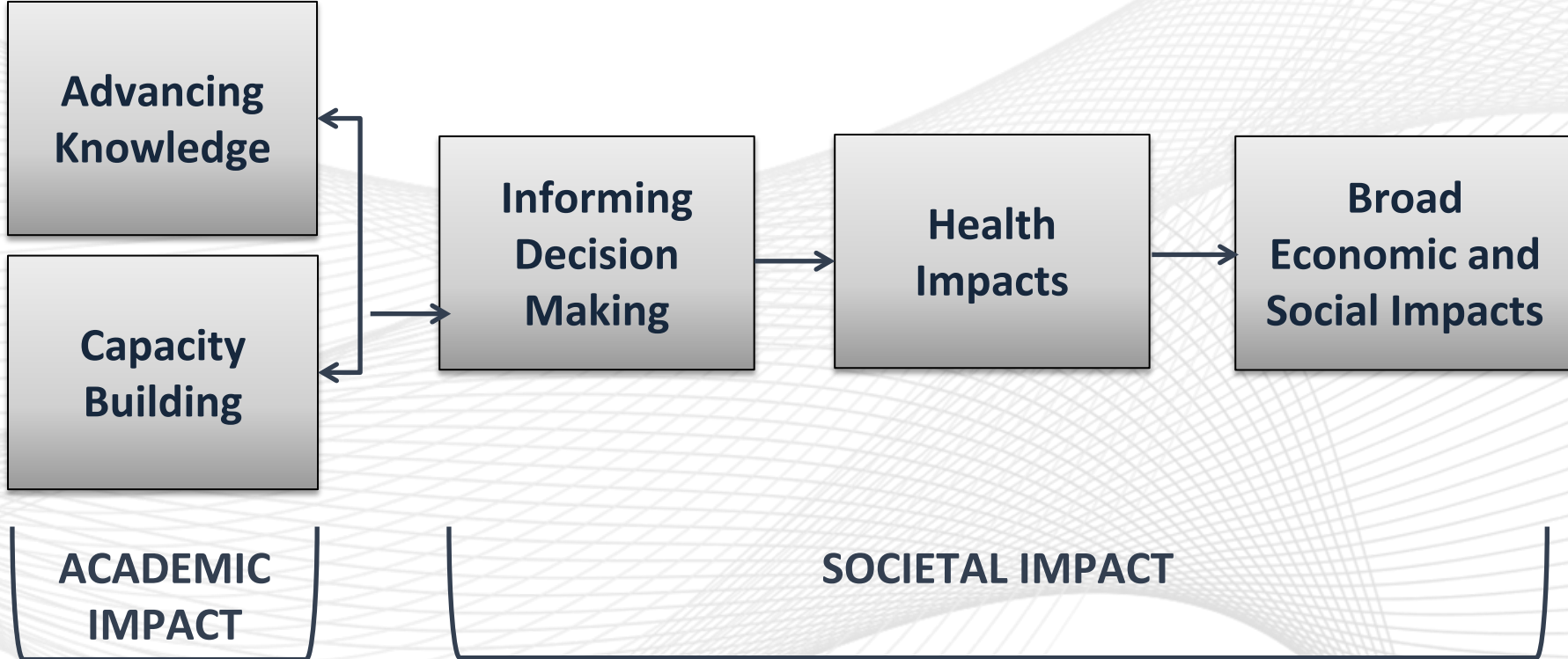
- ▶ **The Standard Evaluation Protocol (SEP), NL** - describes the methods used to assess research conducted at Dutch universities and Netherlands Organisation for Scientific Research (NOW) and Academy institutes every six years.



# ILLUSTRATIVE EXAMPLE - CAHS IMPACT FRAMEWORK



## Pathways to Impact



Frank et al. Canadian Academy of Health Sciences (2009) [Making an Impact: A preferred framework and indicators to measure returns on investment in health research](#)

# CAHS SAMPLE MENU OF INDICATORS



## Academic Impact

### Advancing Knowledge

- Relative citation impact
- Highly cited publications
- Publications in high quality outlets
- Co-author analysis
- Field analysis of citations

### Capacity Building

- Graduated research students in health-related subjects
- Number of research and research related staff in Canada
- Levels of additional research funding
- Infrastructure grants (\$)

### Informing Decision Making

- Use of research in guidelines
- Consulting to policy
- Number of patents licensed

### Health Impacts

- Adherence to clinical guidelines
- QALYs
- PROMs
- Wait times

### Broad Economic & Social Impacts

- Licensing returns (\$)
- Product sales revenues (\$)
- Valuation of spin out companies (\$)
- Happiness
- Socio-economic status

## Wider Impact

Multiple Data Methods and Sources

Institutional Purpose and Targeted Impacts

# DOES YOUR INSTITUTION FOLLOW STANDARDS OR GUIDELINES



## Guidelines, Manifesto, Standards, Frameworks, Professional Organizations

### RECOMMENDATIONS

The San Francisco Declaration on Research Assessment (DORA), initiated at the 2012 Annual Meeting of the American Society for Cell Biology by a group of editors and publishers of scholarly journals, recognizes the need to improve the ways in which the outputs of scientific research are evaluated.

### What does DORA say?

DORA makes one general and 17 specific recommendations.

#### General recommendation:

Do not use journal-based metrics, such as Journal Impact Factors (JIFs), as surrogate measures of the quality of individual research articles, to assess an individual scientist's contributions, or in hiring, promotion, or funding decisions.

#### For Organizations That Supply Metrics

- Be transparent
- Provide access to data
- Discourage data manipulation
- Provide different metrics for primary literature and reviews

#### For Publishers

- Cease to promote journals by Impact Factor; provide an array of metrics
- Focus on article-level metrics
- Identify different author contributions
- Open the bibliographic citation data
- Encourage primary literature citations

#### For Research Institutions

- When hiring and promoting, state that scientific content of a paper, not the JIF of the journal where it was published, is what matters
- Consider value from all outputs and outcomes generated by research

#### For Funding Agencies

- State that scientific content of a paper, not the JIF of the journal where it was published, is what matters
- Consider value from all outputs and outcomes generated by research

#### For Researchers

- Focus on content
- Cite primary literature
- Use a range of metrics to show the impact of your work
- Change the culture!

San Francisco  
**DORA**  
Declaration on Research Assessment



See the full text of DORA at [www.ascb.org/SFDeclaration.html](http://www.ascb.org/SFDeclaration.html). Sign the Declaration!

<https://sfdora.org/>

### RESEARCH METRICS STANDARDS

#### nature

Explore content ▾ About the journal ▾ Publish with us ▾

[nature](#) > [comment](#) > [article](#)

Published: 22 April 2015

#### Bibliometrics: The Leiden Manifesto for research metrics

[Diana Hicks](#) [Paul Wouters](#), [Ludo Waltman](#), [Sarah de Rijcke](#) & [Ismael Rafols](#)

*Nature* 520, 429–431 (2015) | [Cite this article](#)

19k Accesses | 914 Citations | 2161 Altmetric | [Metrics](#)

Use these ten principles to guide research evaluation, urge Diana Hicks, Paul Wouters and colleagues.

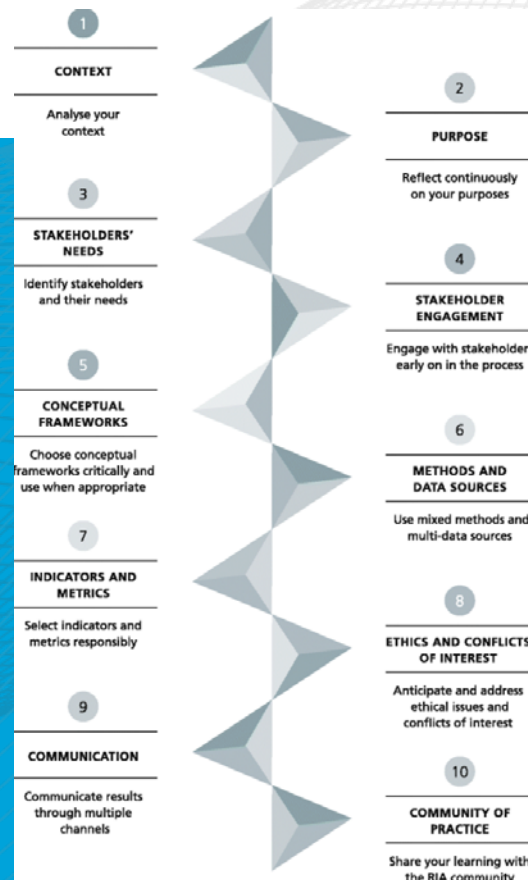


Credit: Illustration by David Parkins

Data are increasingly used to govern science. Research evaluations that were once bespoke and performed by peers are now routine and reliant on metrics<sup>1</sup>. The problem is that evaluation is now led by the data rather than by judgement. Metrics have proliferated: usually well intentioned, not always well informed, often ill applied. We risk damaging the system with the very tools designed to improve it, as evaluation is increasingly implemented by organizations without knowledge of, or advice on, good practice and interpretation.

<http://www.leidenmanifesto.org/>

### ISRIA IMPACT STATEMENT



<https://health-policy-systems.biomedcentral.com/articles/10.1186/s12961-018-0281-5>

### AEA – EVALUATION ASSOCIATIONS



Research, Technology & Development  
Topical Interest Group

### Evaluating Outcomes of Publicly-Funded Research, Technology and Development Programs: Recommendations for Improving Current Practice

Version 1.0

Prepared by the Research, Technology and Development Evaluation  
Topical Interest Group of the American Evaluation Association (AEA)

February 2015

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[https://higherlogicdownload.s3.amazonaws.com/EVAL/271cd2f8-8b7f-49ea-b925-e6197743f402/UploadedImages/RTD%20Images/FINAL\\_RTDPaper\\_20150303.pdf](https://higherlogicdownload.s3.amazonaws.com/EVAL/271cd2f8-8b7f-49ea-b925-e6197743f402/UploadedImages/RTD%20Images/FINAL_RTDPaper_20150303.pdf)



# EXAMPLE OF MONITORING TOOLS TO TRACK PROGRESS



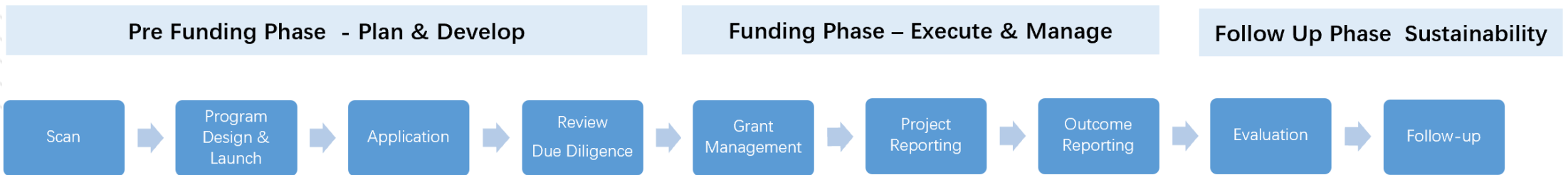
## Impact reporting tools

- Altmetric
- Dimensions
- Grow Impact
- InCites (Clarivate)
- Pure, SciVal (Elsevier)
- Researchfish
- Vertigo Ventures Impact Tracker

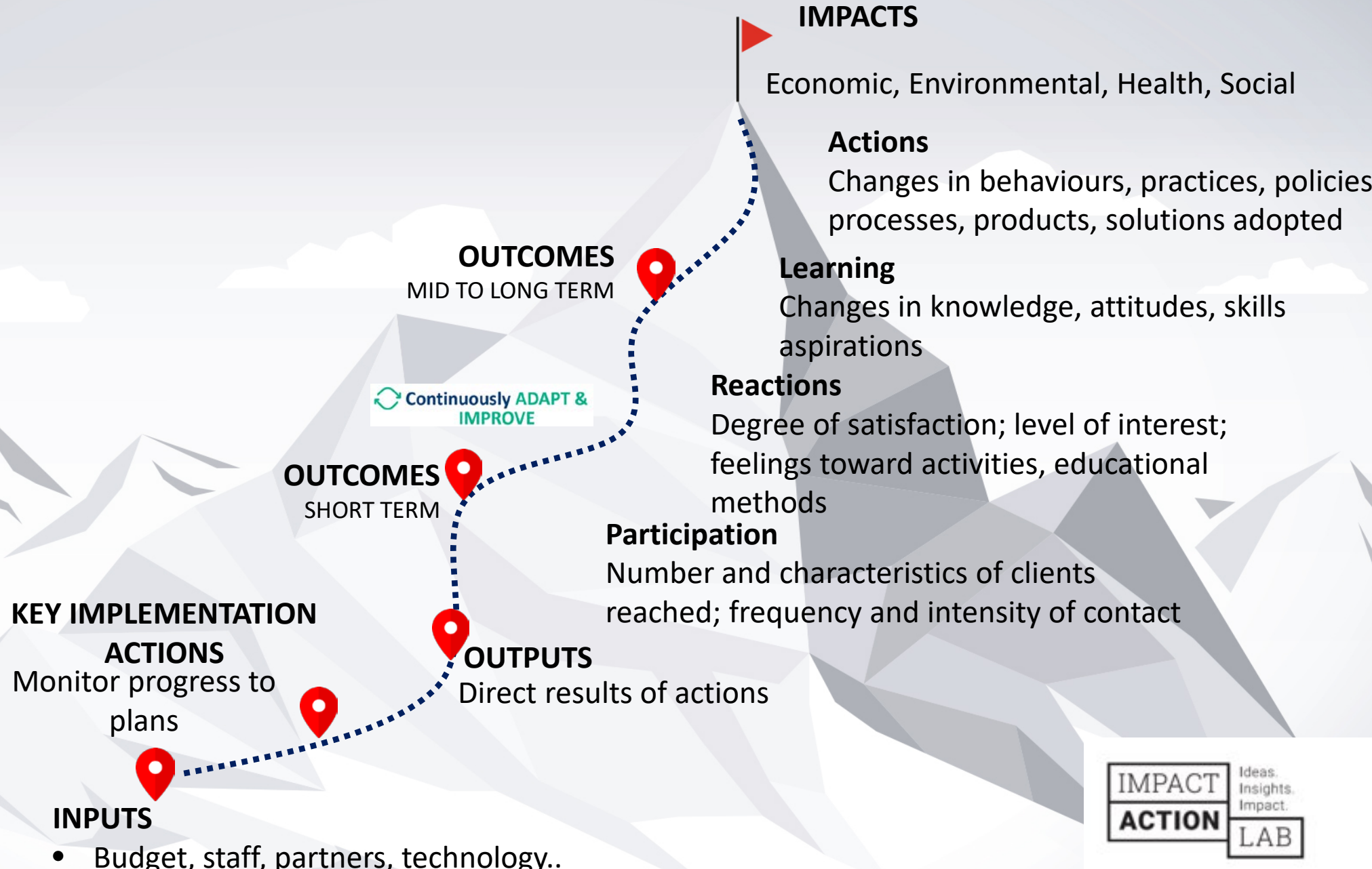
## Other Institutional Monitoring tools

- Resumes - ORCID
- Financial
- Human Resource
- Customer Relationship Management
- Communications and Marketing
- Grant Management
  - Grant applications & end of grant reports
- Impact Narratives

## MAPPING TOOLS ACROSS THE RESEARCH LIFE CYCLE



# CUSTOMIZING AND BALANCING INDICATORS ALONG PATHWAYS



# CRITERIA FOR SELECTING A BALANCED SET OF INDICATORS



F

Focused on the organization's objectives

A

Appropriate for the stakeholders who are likely to use the information

B

Balanced to cover all significant areas of work performed by an organization

R

Robust enough to cope with organizational changes (such as staff changes)

I

Integrated into management processes

C

Cost-effective (balancing the benefits of the information against collection costs)

Source: HM TREASURY, CABINET OFFICE, NATIONAL AUDIT OFFICE, AUDIT COMMISSION, and OFFICE FOR NATIONAL STATISTICS, 2001. [Choosing the Right FABRIC: A Framework for Performance Information](#). London, UK: HM Stationary Office.



GROUP  
DISCUSSION

## Discussion questions:

1. *Are there other tools that your institution uses?*
  - *Any emerging tools or practices on your radar?*
2. *What are some of the indicators of interest for your institution?*



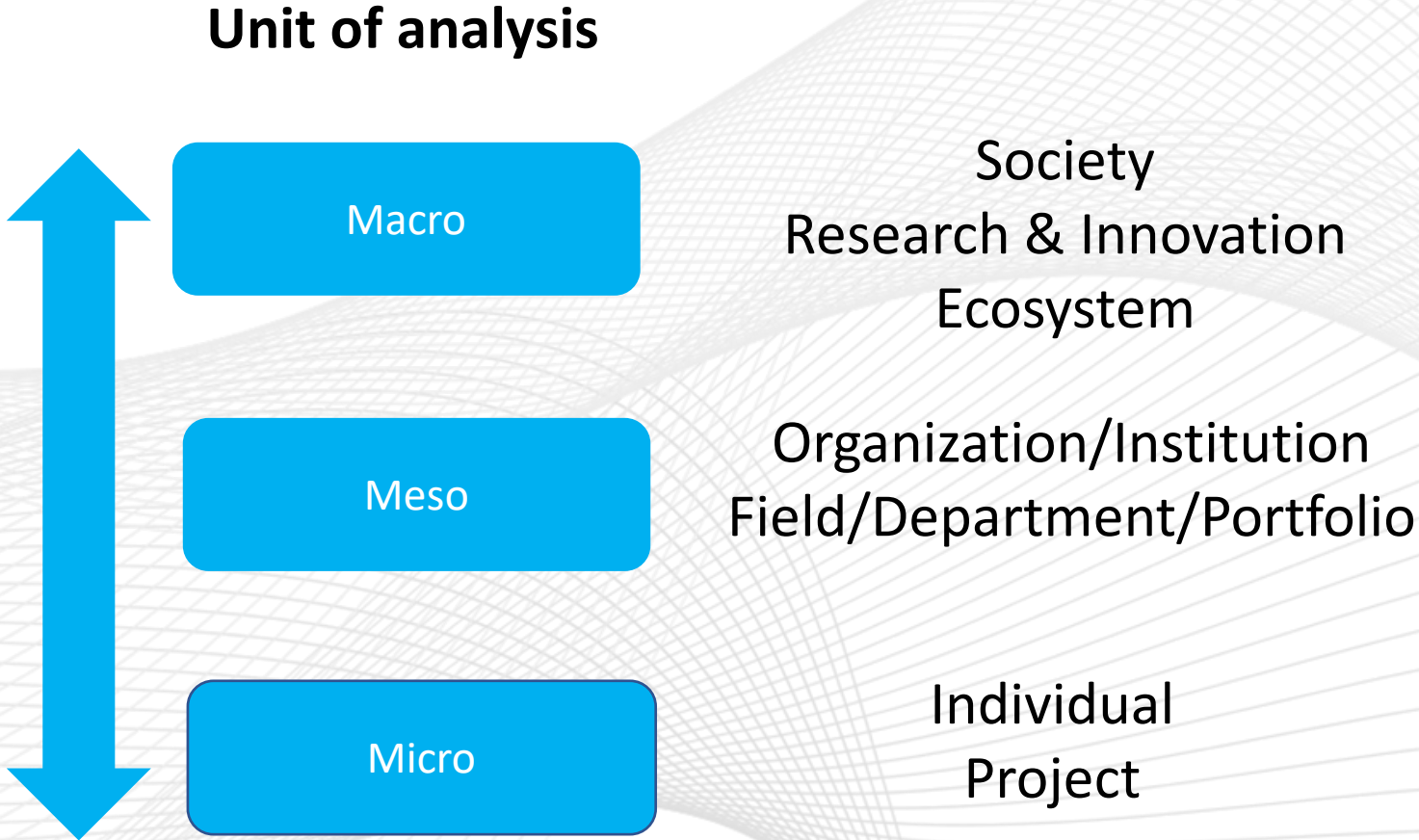
# 3. FIT FOR PURPOSE CONSIDERATIONS

## - TRADE OFFS

# FIT FOR PURPOSE CONSIDERATIONS FOR MEASURING



- Context and strategic alignment
- Unit of analysis for indicators
- Time to achieve impact
- Flexibility versus Comparability



# TWO APPROACHES



## Benchmarking for Comparison Purposes

Easier to benchmark if use standardized indicators with definitions

- Enables comparison across different organizations
- Assist in driving continuous improvement



## Use of Impact Categories allows "Fit for Purpose" Indicators

Identifies common impact areas

- Encourages thinking about the types of impact
- Can choose different indicators
- Allows for customised continuous improvement





# TWO APPROACHES: NAPHRO INDICATORS



NAPHRO indicators
Provincial share of national & other funding
Research & Innovation (R&I) GDP
Pharmaceutical R&I spending
Biotechnology R&I spending
Federal-level funding success rates
Patents
Licensing
Spin-offs
Employment
Educational impacts



# TWO APPROACHES: CSIRO FIT FOR PURPOSE INDICATORS



## ENVIRONMENTAL IMPACT CATEGORIES

1. Air quality
2. Ecosystem health and integrity
3. Climate
4. Natural hazards mitigation
5. Energy generation and consumption
6. Land quality
7. Aquatic environments
8. Built environments

## SOCIAL IMPACT CATEGORIES

1. Health and wellbeing
2. Access to resources and opportunities
3. Quality of life (material security and livelihoods)
4. Safety
5. Security (e.g. cyber, biological, civil and military)
6. Resilience
7. Indigenous culture and heritage
8. Innovation and human capital (creativity and invention)
9. Social cohesion

## ECONOMIC IMPACT CATEGORIES

1. National economic performance
2. Trade and competitiveness
3. Productivity and efficiency
4. Management of risk and uncertainty
5. Policies and programs
6. New services, products, experiences and markets
7. Securing and protecting existing markets

# Key Messages



- Metrics that matter are guided by institutional purpose and strategy
- Monitoring measures helps track progress to impact and achievement of goals
  - Progress metrics inform action and decisions to adjust
- Use metrics responsibly and select a balanced set of KPIs using criteria
  - Measurement is a science

*Don't rush the process*

# KEY RESOURCES



Wilsdon J, et al. (2015). [\*The metric tide. Report of the independent review of the role of metrics in research assessment and management.\*](#) HEFCE.

Graham KE, et al. (2018). [Assessing health research and innovation impact: evolution of a framework and tools in Alberta, Canada.](#) *Frontiers in Research Metrics and Analytics*, 3, 25.

Adam P, et al. (2018). [ISRIA statement: ten-point guidelines for an effective process of research impact assessment.](#) *Research Policy and Systems*, 16, 8.

Ling T, & Villalba van Dijk L. (2009) [Performance audit handbook: Routes to effective evaluation.](#) RAND Europe.

Guthrie S, et al. (2016). [100 Metrics to assess and communicate the value of biomedical research: An ideas book.](#) Santa Monica, CA: RAND Corporation.



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Insights.  
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# THANK YOU.

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